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This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-5 (cancelled)

Claim 6 (currently amended): An apparatus for simulating conditions of bipedal locomotion for a human subject, comprising:

a conveyor defining a velocity;

a velocity sensor that measures the velocity of the conveyor;

a force-measuring sensor;

a restraint operably coupled to the sensor to measure a force applied to the restraint by a human subject;

a controller configured to control the velocity of the conveyor based, at least in part, ~~upon the force measured by the sensor~~ utilizing a haptic equation that incorporates an equation of motion describing bipedal human locomotion.

Claim 7 (original): The apparatus for simulating conditions of bi-pedal locomotion for a human subject of claim 6, including:

a sensor coupled to the controller and adapted to detect the position of a human subject on the conveyor.

Claim 8 (currently amended): ~~The apparatus for simulating conditions of bi-pedal locomotion for a human subject of claim 6, wherein:~~ An apparatus for simulating conditions of bipedal locomotion for a human subject, comprising:

a conveyor defining a velocity;

a force-measuring sensor;

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a restraint operably coupled to the sensor to measure a force applied to the restraint by a human subject;

a controller configured to control the velocity of the conveyor based, at least in part, upon the force measured by the sensor; and wherein the sensor comprises a stereoscopic sensor adapted to detect the position of each leg of a human subject on the conveyor.

Claim 9 (original): The apparatus for simulating conditions of bi-pedal locomotion for a human subject of claim 6, wherein:

the restraint comprises a harness adapted to fit around a waist of a human subject, and a tether connecting the harness to the apparatus.

Claim 10 (original): The apparatus for simulating conditions of bi-pedal locomotion for a human subject of claim 6, wherein:

the restraint comprises a blocking dummy.

Claim 11 (original): The apparatus for simulating conditions of bi-pedal locomotion for a human subject of claim 6, wherein:

the restraint comprises a handle configured to simulate a handle of a bob sled.

Claim 12 (original): The apparatus for simulating conditions of bi-pedal locomotion for a human subject of claim 6, including:

an overhead support structure;

an overhead harness connected to the overhead structure and adapted to provide a lifting force on a human subject;

a powered winch adapted to raise and lower the overhead harness;

a sensor adapted to measure a force acting on the overhead harness; and wherein:

the controller is configured to actuate the winch to generate an upward force on a human subject.

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Claim 13 (original): The apparatus for simulating conditions of bi-pedal locomotion for a human subject of claim 12, wherein:

the apparatus defines a forward portion and a rearward portion; and

the restraint comprises a harness and a forward tether connecting the harness to the forward portion of the apparatus, and a rearward tether connecting the harness to the rearward portion of the apparatus.

Claim 14 (original): The apparatus for simulating conditions of bi-pedal locomotion for a human subject of claim 6, including:

an electric motor coupled to the conveyor for moving the conveyor;

a brake coupled to the conveyor for exerting a braking force on the conveyor; and

wherein:

the controller is configured to control the brake and motor based, at least in part, upon a haptic equation.

Claim 15 (original): The apparatus for simulating conditions of bi-pedal locomotion for a human subject of claim 14, wherein:

the haptic equation comprises a sprint simulation.

Claim 16 (original): The apparatus for simulating conditions of bi-pedal locomotion for a human subject of claim 14, wherein:

the haptic equation comprises a bob sled simulation.

Claim 17 (original): The apparatus for simulating conditions of bi-pedal locomotion for a human subject of claim 16, wherein:

the controller controls the velocity based, at least in part, upon an equation that provides an isokinetic overspeed mode of operation.

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Claim 18 (original): The apparatus for simulating conditions of bi-pedal locomotion for a human subject of claim 16, wherein:

the controller controls the velocity based, at least in part, upon an equation that provides an isotonic overspeed mode of operation.

Claim 19 (original): The apparatus for simulating conditions of bi-pedal locomotion for a human subject of claim 16, wherein:

the controller controls the velocity based, at least in part, upon an equation that provides a terminal velocity determination mode of operation.

Claim 20 (original): The apparatus for simulating conditions of bi-pedal locomotion for a human subject of claim 14, including:

an input device coupled to the controller for inputting variables; and wherein:

the controller utilizes the variables and haptic equation to control the velocity of the conveyor.

Claim 21 (currently amended): An apparatus for simulating forces and movement of a human subject during a physical activity, comprising:

a base;

a movable member mounted to the base, the movable member defining a velocity and receiving [[a]] an input force applied to the movable member by a human subject;

a force-generating device operably coupled to the movable member [[for]] and applying a resistance force to the movable member;

a sensor configured to provide a signal corresponding to at least one of the velocity of the movable member and [[a]] an input force applied to the movable member by a human subject; and

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a controller configured to control the resistance force applied to the movable member by the force-generating device based, at least in part, on ~~[[the]]~~ a signal provided by the sensor and a haptic equation relating the force and velocity incorporating an equation of motion of a human subject performing the physical activity being simulated.

Claim 22 (original): The apparatus of claim 21, wherein:
the movable member comprises a conveyor.

Claim 23 (original): The apparatus of claim 21, wherein:
the haptic equation relates the velocity to a time integral of the force.

Claim 24 (original): The apparatus of claim 21, wherein:
the haptic equation relates the velocity to a time integral of a square of the velocity.

Claim 25 (original): The apparatus of claim 21, including:
a restraint adapted to react a force applied by a human subject.

Claim 26 (original): The apparatus of claim 25, wherein:
the sensor determines a force applied to the restraint.

Claim 27 (original): The apparatus of claim 21, wherein:
the force-generating device comprises a brake.

Claim 28 (original): The apparatus of claim 27, including:
a motor operably coupled to the movable member, the controller configured to control the motor based on a haptic equation relating the force and velocity.

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Claim 29 (new): The apparatus of claim 21, wherein:

the controller calculates at least one of a target input force and a target velocity utilizing a haptic equation of motion and controls the force-generating device based on at least one of the target input force and a target velocity.